

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

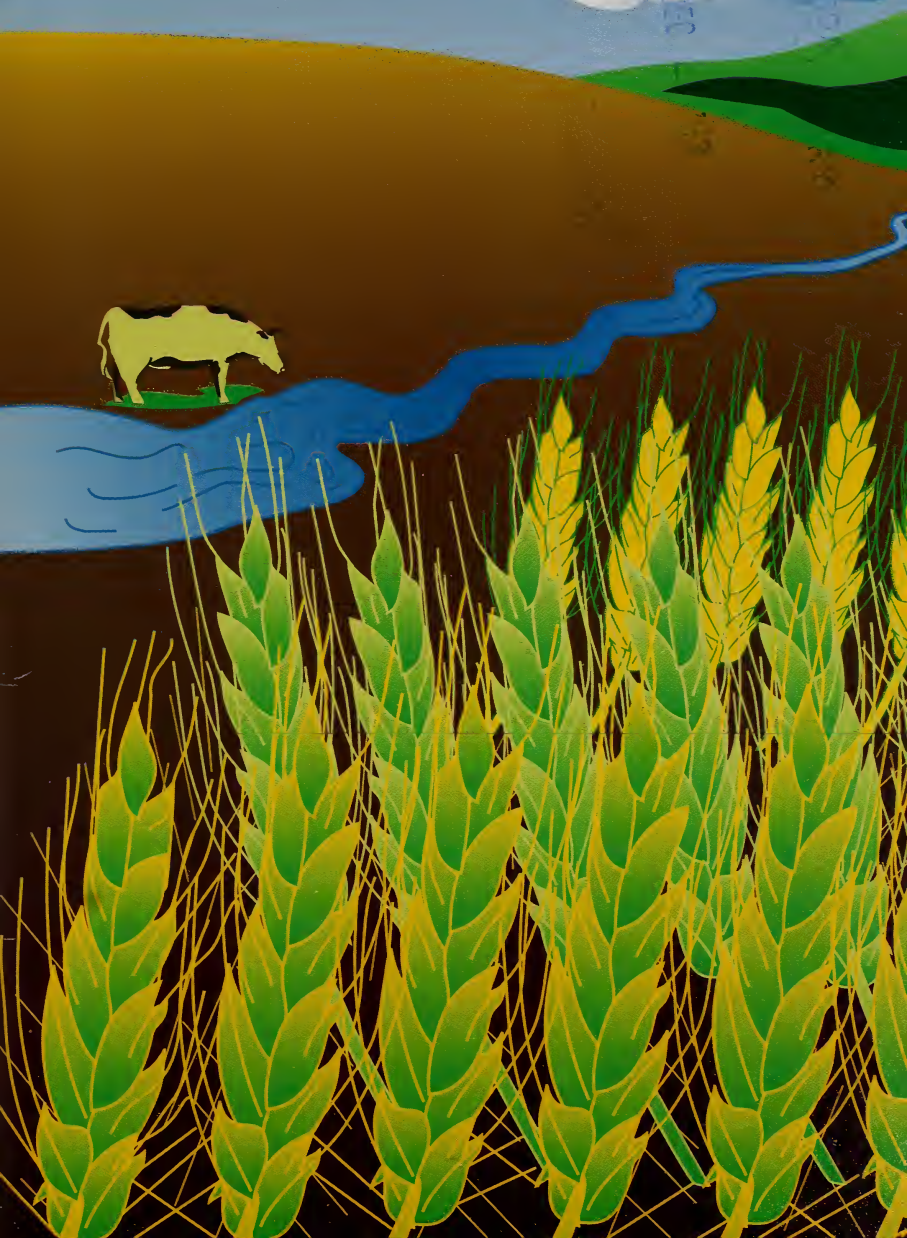
1
Ag 84Pro
C5

States
ment of
ture

Agricultural
Research
Service

Program
Aid 1502

Agricultural Research Service





Program Aid 1502
Issued July 1993

This publication supersedes "All About the Agricultural Research Service," issued in October 1984.

The U.S. Department of Agriculture offers its programs to all eligible persons regardless of race, color, age, disability, sex, or national origin, and is an equal opportunity employer.

Trade names are used in this publication solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture or an endorsement by the Department over products not mentioned.

Agricultural Research Service

The principal scientific research agency of the U.S. Department of Agriculture

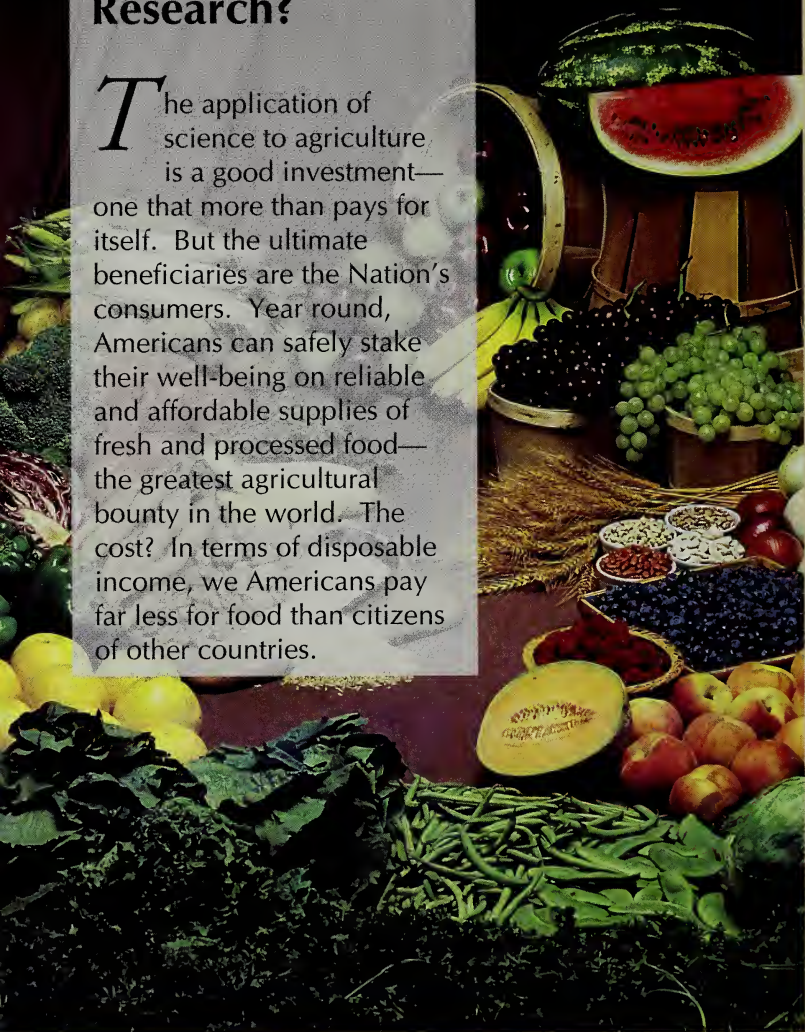


The Agricultural Research Service spans facilities in 127 locations. They're strategically located in the major farm and rangeland ecosystems throughout the United States and overseas, enabling ARS to bring research expertise to bear on problems of national scope from many different geographic vantages. Of the approximately 8,100 ARS employees, one-third are scientists and engineers; the rest provide critical support.



Why Agricultural Research?

The application of science to agriculture is a good investment—one that more than pays for itself. But the ultimate beneficiaries are the Nation's consumers. Year round, Americans can safely stake their well-being on reliable and affordable supplies of fresh and processed food—the greatest agricultural bounty in the world. The cost? In terms of disposable income, we Americans pay far less for food than citizens of other countries.



A Commitment to Scientific Excellence



A tissue-cultured peach tree plant began life as a few cells that were screened for disease-resistance.

In addition to research offering immediate benefits to the consumer, much ARS research lays the foundation for future commercial development. A growing proportion falls under the broad heading of biotechnology. Many of these projects attack long-term problems. In some cases, the probability of success may not even be known at the outset of the project.



Under ultraviolet light, a plant pathologist inspects an electrophoretic gel of replicative-form double-stranded plant viral RNA from a geranium plant. This procedure is used to detect RNA virus infections in plants.

The Mission

ARS pursues several broad objectives critical to maintaining and improving our quality of life.

ARS works to enhance U.S. competitiveness in world markets, help conserve natural resources, and minimize the impact of agricultural production on the environment. Research also targets specific problems threatening our food and fiber supplies, contributes to rural revitalization, and increases knowledge of human nutrition.



Soil testing, underground chamber.



A videocamera adapted to microscopic study zooms in on earthworm larvae.

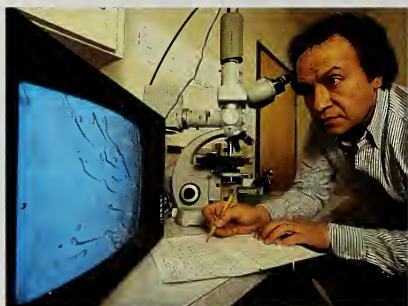
(Facing page) The atmosphere surrounding this orange tree contains an extra amount of carbon dioxide. Scientists hope to learn how stepped-up atmospheric emissions affect fruit production.



☞ *Conserving and
wisely managing
our soil, water,
and air resources*



*Improving the
productivity,
health, and well-
being of animals*



Animal scientist checks the
survival of ram spermatozoa
previously preserved in liquid
nitrogen.





Finding better ways to convert raw agricultural commodities into food and products and deliver these goods to the consumer and export markets

Newsprint inks in both black and color formulations can now be made from 100 percent soybean oil.

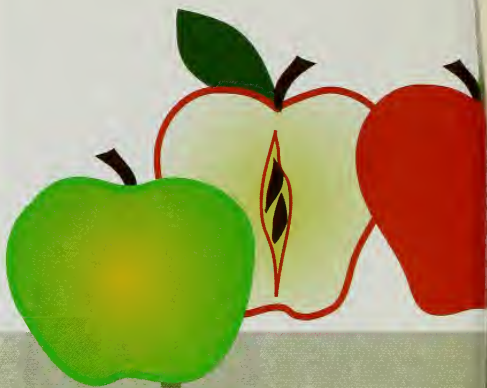
(Right) Chemist tests trapping capabilities—the ability to print a wet ink film over previously printed ink—on a hand-operated printing press.



(Below) Colorful fabric bolts bespeak the benefits of improved cotton dyeing processes.



☛ *Enhancing the
productivity and
quality of crop
plants*



Plants interpret changes in the spectrum of light as signals to sprout, flower, or grow.

Enhancing the
productivity and
quality of crop
plants



Biocontrol in action: This parasitic wasp deposits eggs in a larval pest.



Plants interpret changes in the spectrum of light as signals to sprout, flower, or grow.



A new iceberg mini-lettuce makes just enough salad for one person to eat at one sitting.

(Left) Researchers are sometimes able to change the course of a plant's development—for example, causing fruit to be larger or leaves to proliferate—by covering the ground with colored mulch.



*Promoting health
and quality of life
through a better
understanding of
human nutrition*



While nutrition study volunteers enjoy their meals, the kitchen staff in the background monitors their progress to make sure the correct quantities are consumed.

(Left) Volunteer demonstrates muscle strength to nutrition scientist at the USDA-ARS Human Nutrition Research Center on Aging at Tufts University.



Calorimeters, whether room-sized or fitting just over a subject's head, measure how much energy a body burns under controlled conditions.



Integrating scientific knowledge into systems that help Americans make the most of our resources and enable the transfer of technology from laboratory to farm



Soil scientists review data for a computer program that helps professionals and homeowners determine if they have a nitrate leaching problem on an individual site.

(Left) Using aerial infrared images, a statistician compares field data of crops affected by saline soils.

A Harvest of Ideas

Here's a mere sampling of the myriad innovations that ARS research has brought forth:

• *The Bradford ornamental pear trees that now grace thousands of city streets...*

• *Biodegradable plastic films made from cornstarch for environment-friendly trash bags and garden mulches...*

• *All cotton wash-and-wear fabrics that need little or no ironing...*



• *The underlying technology for barcoded supermarket checkout systems...*



• *A frozen dessert made with Oatrim, a new ingredient that lowers blood cholesterol and reduces fat and calories in many food products...*

• *A new source of the cancer treatment drug taxol spares the rare Pacific yew tree...*

• *Modified milk that enables lactose-intolerant people to enjoy dairy products...*

• *Discovery of the viroid, the smallest known agent of plant diseases...*



🍷 *Flame, the world's first red seedless grape...*

🍷 *Superslurper, a water-absorbing cornstarch derivative with dozens of uses—from diapers to fuel filters...*

🍷 *Ambersweet, the first hybrid orange able to survive the devastating freezes that plague the Florida citrus industry...*



🍷 *A high-fiber, no-calorie flour created via an ARS-patented process produces fiber-rich breads, waffles, muffins, and pancakes...*

🍷 *Discovery of phytochrome, a biomechanism that controls flowering, growth, and development of plants...*

🍷 *Eradication of animal diseases like hog cholera, exotic Newcastle disease, and vesicular exanthema...*

• *An edible coating that extends the fresh-market shelf life of tomatoes and oranges...*

• *Lemont, a high-yielding, lodge-resistant semidwarf rice that's boosted U.S. rice sales in world markets...*

• *Establishing relationships among diet and risk factors associated with coronary heart disease...*



• *Computerized irrigation systems that require less water and minimize power overloads...*

• *Gaines wheat, the first commercial semidwarf cereal grain, linchpin of the Green Revolution...*



• *Increased Hereford twinning raised fertility rates of beef cattle...*



• *Poultry vaccines like the one against Marek's disease (in 10 years, this vaccine repaid the cost of its own development)...*



• *Center-pivot sprinklers, controlled by a central computer, here irrigating wheat, alfalfa, potatoes, and melons in Oregon...*

• *Thornless blackberries...*

• *Elimination of screwworms from the United States and Mexico, thanks to sterile fly release...*

• *Near-infrared reflectance spectroscopy, a technology that's revolutionized how commodities are graded and that has promising applications in medicine and pharmacy...*



• *A computerized spectrophotometer that takes an interactance measurement of a tomato to determine its chlorophyll, lycopen, and carotene content, possible measures of chill injury.*

